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Dear Josh,

I was looking forward to seeing you at the Fed. or SAB meetings and was quite disappointed to find that you did not attend either. In particular I wanted to discuss with you a problem in nomenclature. I have been investigating the nutritional requirements of different strains of P. pestis and find that they require in a glucose mineral medium at 30° C from two to five different amino acids. I have succeeded in isolating from one strain which requires phenylalanine, valine, isoleucine, methionine, and cystine, mutants less demanding of their environment, i.e. mutants independent of methionine, or valine and isoleucine, or of all three amino acids. The problem of a general descriptive name for these mutants arose. Obviously the term "gain" mutation is poor.

In discussing this problem with Luria, Davis, Braun, Bryson, Eagle, etc. at the SAB meeting, I began to realize that there exists general confusion even among the experts concerning the word prototroph. To Luria in particular and to several others this word has come to mean not only the nutritional phenotype of a wild type (as you have used the word) but of a particular wild type, that is, one independent of any specific growth factors. In other words prototroph is synonymous with an organism with the phenotypic growth requirements of wild type E. coli. This misusage is quite understandable since most genetic research with bacteria has been almost completely confined to E. coli or to organisms with the simple requirements of E. coli. Luria has gone so far as to suggest that we find a new word in place of prototroph for organisms with wild type growth factor requirements. I feel that his use of the word prototroph is unnecessarily limiting and is a distortion of your definition of the word. Because of this confusion it was impossible to get to first base, in the short time available, with the problem of naming a class of mutants which I have been concerned with.

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Using your definition of prototroph as the basic word, mutations from the wild type or from the prototroph can be viewed as going in either of two directions as far as nutritional requirements are concerned.

les, diminished requirements \rightleftharpoons wild type \rightleftharpoons increased requirements for
for nutrilites \rightleftharpoons prototroph \rightleftharpoons nutrilites
ischnotroph auxotroph

The word auxotroph as derived by B. Davis, as you are well aware, has been subject to criticism since it combines both Latin auxilium and Greek trophos. However it has been pointed out to me by Dr. J. B. Saunders of U. C. that the Latin auxilium is derived from the Greek auxanein meaning to increase, hence, auxotroph would be acceptable to the nomenclature lads if regarded as derived from auxanein and trophos.

Mutations in the opposite direction toward less or diminished requirements could be met by the word ischnotroph. The opposite of auxanein is ischnainein which gives the adjective ischnos (stem - ichno) meaning diminished, lean, meager.

I wonder whether you have thought about this problem and would have any suggestions to make.

I enjoyed Zinder's and your paper on transduction. Can transduction be performed with phage lysates from non-lysogenic bacteria? I am particularly interested in the problem of transduction of virulence. Are you contemplating any experiments along this line? Have you thought of transducting a so-called "negative" hereditary trait?

Regards,



P. S. I am sending you a copy of a manuscript describing some of the nutritional work that I have been doing with P. pestis. It should appear in the May or June issue of the J. Bact.